TALKING ABOUT PILOT AND CONTROLLER TRAINING AND COMPETENCIES

Pilot and air traffic controller training specialists rarely come together to learn from one another, but the competencies have similarities and differences that may be of interest. In this article, **Florence-Marie Jégoux and Jérôme Schimpff** talk about their two worlds.

KEY POINTS

- **Pilots and controllers have some similar issues. Their training is also quite similar and it may be enriched by learning from one another.**
- **Training of technical skills is necessary but not sufficient for the appropriate current level of safety. Training technical as well as non-technical competencies is essential to improve this.**
- **The Alternative Training and Qualification Program (ATQP) concept shows that a next step is to adapt the training to the trainee.**

Ratings

Florence-Marie: So, can you tell me how a type rating training is done for pilots?

Jérôme: Well, first of all, to acquire technical skills, trainees go through some ground classes where they learn aircraft systems. It lasts a few weeks. They then go to the flight simulator for approximately eight to 10 sessions of four hours each. Here, they perform most of the abnormal procedures (engine failure, emergency descent, hydraulic failures, etc). Instructors then focus on technical skills with a limited operational context: no consideration for passengers or diversions. A positive skill test at this step enables trainees to join the 'real world' by flying a real aircraft. For a first 'liner' rating, they will undertake base training, which comprises six 'touch and go' manoeuvres, at a low traffic airport, on an aircraft with no passengers. For next ratings, these 6 mandatory movements are done in a flight simulator.

Then it's time to face real life and passengers, under supervision of an Instructor. This is called line training. Instructors then focus on operational context. After a certain amount of flights under supervision the future pilot has to pass a 'line check'.

What about you? Do controllers have a kind of 'type rating'?

Florence-Marie: Yes. There are specific ratings depending on the different positions. It all depends on the airport or the area centre, but for instance, here there are three control positions: ground, tower and approach. For each position, you have a specific rating. When trainees arrive at the training department, whether they come from initial school or from another control centre, they start with theoretical courses. Those last a few weeks and at the end their instructor starts working on the position with them. When there's a simulator (for instance, here, there's only an approach simulator), this instructor teaches using simulation, according to their level.

They then see basic radar techniques, emergency stages and technical failures, on aircraft or on tower systems.

Then they enter a team, where they learn to control on real positions, with real traffic. This lasts a few months, up to a year depending on the position: two or three months for ground, three to six months for tower, and five to eleven months for approach. It can be different in other towers and much longer in area control centres. It is also linked to the trainee's background: school, another tower or centre. Each time they complete practical training on a position, when they are ready, they sit exams, before starting another rating theoretical training.

Jérôme: Do they take exams on simulator or on position?

Florence-Marie: On position. When you talk to a controller over a frequency, he or she could be sitting an exam… What about your exams?

Jerôme: Well in fact you could also talk to a pilot on frequency who is taking an exam. Every year, an airline pilot has several assessments: some in a flight simulator, one line check on a regular revenue flight, and one medical check-up. We also have a yearly review of the aircraft systems and company policies performed at the pilot's own pace through a specific learning app on iPad. We talked about skills, but what kind of competencies are you looking for, when training controllers?

Competencies

Florence-Marie: Different competencies are defined by the air navigation service provider. Some are more technical, and some are more non-technical, like decision-making, anticipation, reaction and adaptation, maturity, and cooperation. For each of these competencies, there are positive or negative indicators, based on facts and observations. What about pilots? What competencies are you looking to develop?

Jérôme: Many airlines now use a competency-based model. It evaluates performance of a pilot through technical competencies and non-technical competencies. Technical competencies include hand flying, use of automation, and compliance with procedures. Some airlines also consider knowledge as an integral part of technical competencies. Non-technical competencies include communication skills, decision-making, situation awareness, leadership, and workload management. We use these competencies for initial training as well as for recurrent training.

Continuous and recurrent training

Florence-Marie: Can you tell me about ATQP and TEM?

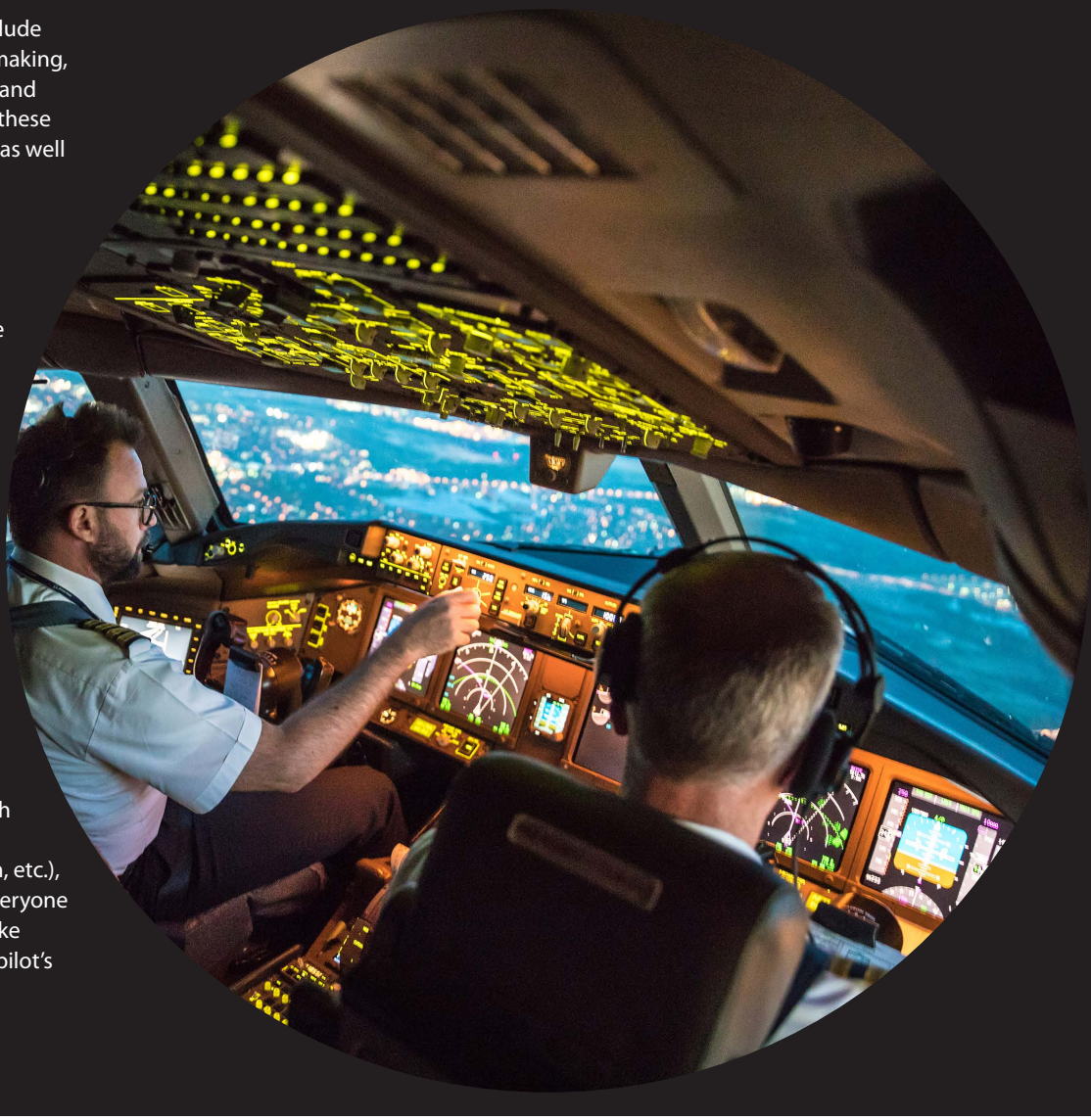
Jérôme: Well, to maintain an acceptable level of skills and competencies, every pilot performs a set of two simulator sessions every six months. The first is a training session, the second is a test. Should a pilot fail a test, he or she will have to get additional training and sit a new test before returning to line. These tests comply with mandatory items set by the Authority. Because every pilot goes through the same tests (engine failure at take-off, non-precision approach, etc.), one could say that this makes everyone equal, but this system doesn't take into account the fact that every pilot's training needs are different.

To deal with this, some airlines have been granted a new standard called ATQP – alternative training and qualification programme. Now, pilots still have four simulator sessions, but they are divided differently. One 'regular' training session is followed the next day by the test session for licenses revalidation. Six months later, there is an evaluation session where a crew conducts line oriented flight training, or LOFT. The instructor chooses a very realistic scenario, with some technical failures, or some non-technical events, such as a sick passenger. This training may bring to light some particular competencies to work on, so it is followed the next day by a session dedicated to the specific needs of this crew. During this recurrent training, the focus is on crew resource management and compliance with operator policies.

During the debriefing, CRM is emphasised with the threat and error management model. To summarise, instructors will get crew members talking about the following points:

- How accurate were the crew at anticipating or recognising a threat?
- Were they able to mitigate it?
- Did the crew detect and correct the errors made?
- What was strong or weak in a set of tools such as procedures, cross check, monitoring, check lists, airmanship, and so on?

We also have CRM training along with security, fire and rescue, etc., as part of a one-day theoretical training. How about controllers' continuous training?



Florence-Marie: They have two days of continuous training each year: standard procedures class, abnormal procedures, or human factors.

On the standard procedures class, they are taught about instructions, working methods, technical systems, and maintenance, for instance. They also visit other control centres to improve coordination.

Unusual and abnormal procedures are mostly seen in simulators. Here in approach control, there is one day theoretical, and one-day practice in the simulator. Controllers face many challenges, with critical piloting situations or with technical systems: engine, radio, radar failure, fire on board, big thunderstorms, etc.

A human factors session focuses on lessons learned, controllers' environment, and instruction, as here all controllers are on-the-job instructors. The themes change every three years, but examples include fatigue and stress, pilot-controller cooperation, safety/performance balance, groups, monitoring and taking action, learning by errors or by example, etc.

To maintain their rating, they also attend English courses and have English exams. The control exam has multiple choice questions, about working procedures, control theoretical knowledge, etc. Now there are new exam procedures, with recurrent exams on position.

When sharing experience…

Florence-Marie: When you talked about the fact that "every pilot gets the same training", it gives me food for thought about what we do here. Some instructors have built personalised simulations for initial training, but it would be interesting to customise the continuous training simulations. I really like the ATQP concept, where pilots are trained for the specific needs of the crew and the focus on CRM. That's something we could work on. We don't have specific simulations to develop human factors competencies.

Jérôme: It would be good to develop and encourage exchange between pilots and controllers. A few years ago, some controller friends came to our simulations in their own time and played the controller role. Their feedback was very interesting.

Florence-Marie: I've been advocating for these exchanges for a long time. Perhaps in the future, a next step to improve and share competencies will be cross-training between controllers and pilots, between units, and between operators and managers. That would really help to strengthen interfaces.

Florence-Marie Jégoux became a private pilot in 2000, a certified air traffic controller in 2004, and an HF facilitator in 2009. She is also a coach and is trained in systems theory. She now works for an ANSP in their training department as a Human Factors facilitator and specialist. She passed an HF University Degree in 2017 in the National Polytechnic Institute of Bordeaux.

Jérôme Schimpff started his career in 1998 as a first officer flying B737-200. Then he flew A310 and B747-200 before switching to the left seat in 2007. Now he is a Type Rating Instructor and Senior Examiner on A320. He obtained a Diploma in "Human Factors for the Conception of Human-Machine Systems" at the Paris V René Descartes University. He has been involved in CRM training for many years and is a member of the French Human Factor Reflection Group.